Cimple Biotechnology

Quantitative Rapid Test for Personal Digital Health

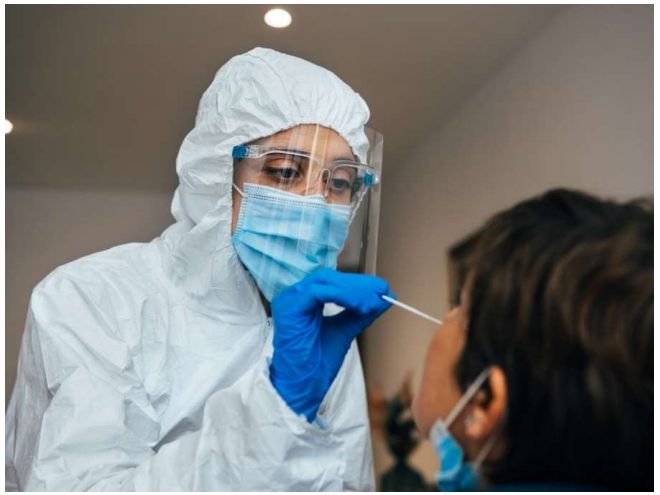
Dr. Liu Wengang

January 2025

At home Test

Outbreak of COVID-19 pandemic

Overwhelmed healthcare system



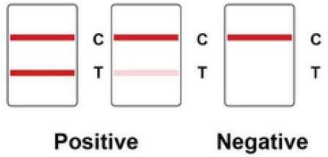
PCR Tests

COVID-19 rapid antigen tests

At-home test emerges as new medical solutions!

Requirements for At-Home Tests

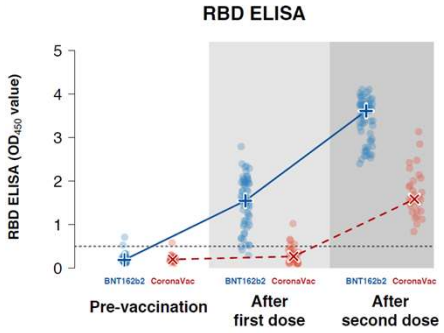
Simple and Low-cost



Rapid Tests

Only qualitative results!

Quantitative Results



COVID-19 Antibody Level

Miniaturized IVD

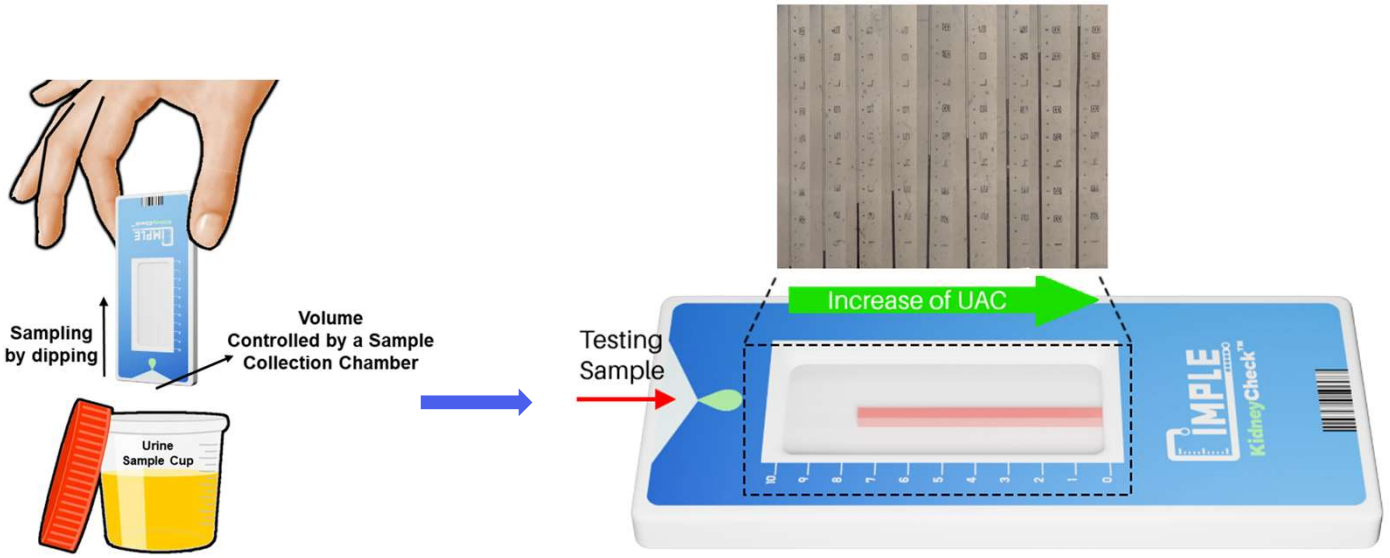
Standard Medical Tests

Expensive and inconvenient!

Our solution

Quantitative Rapid Test (Platform technology)

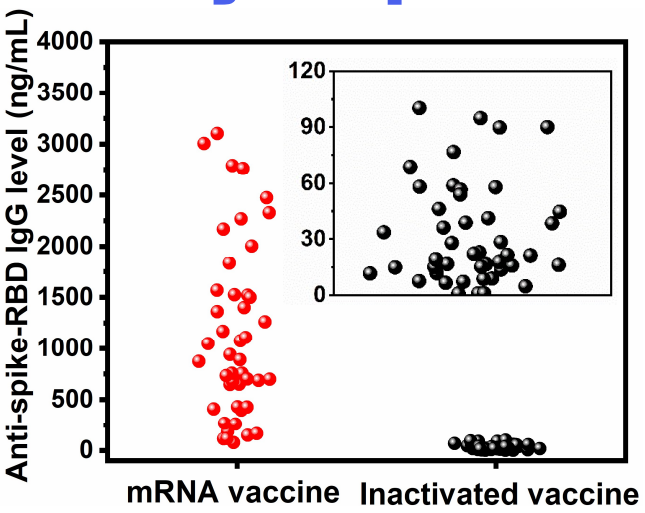
- ☐ Quantifiable
- ☐ Simple
- ☐ Affordable

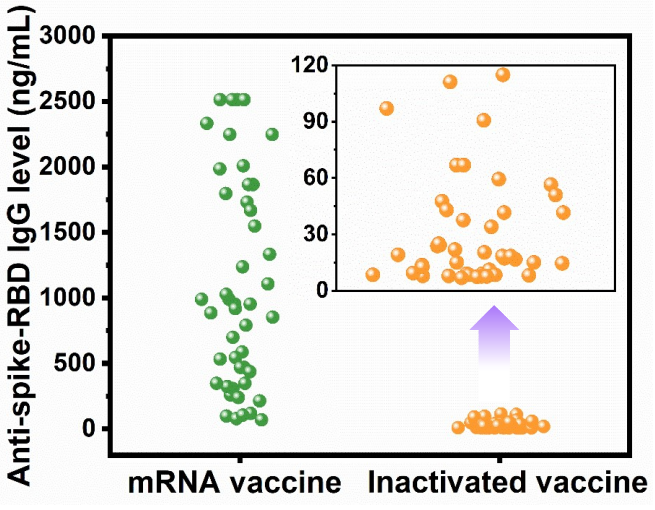


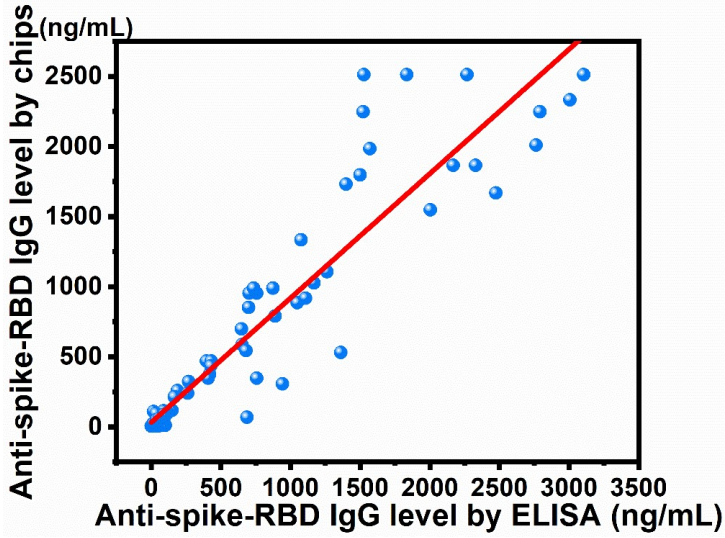
Visual inspection
Detection time < 15 min

Analytical performance

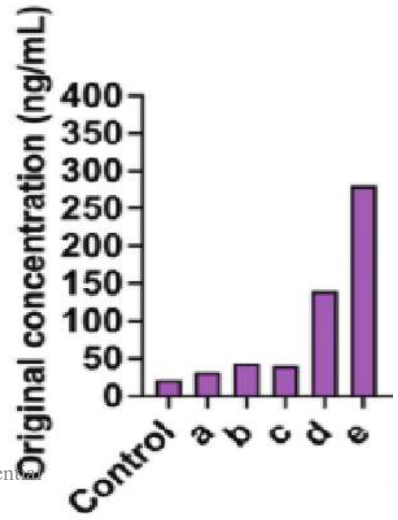
M. Wu, … T. H. Chen*, Science Advances, 8, eabn6064, 2022

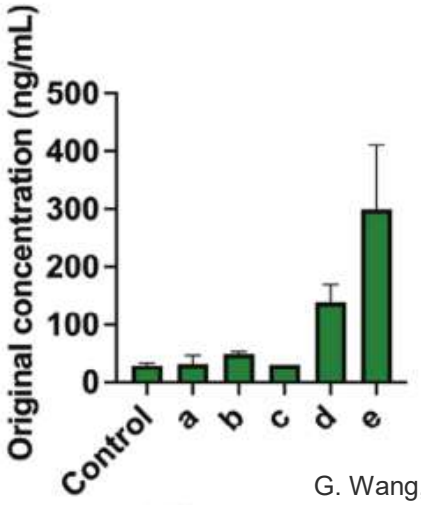


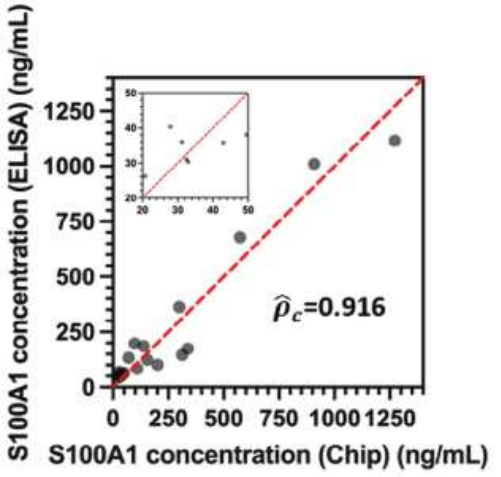




S100A1 Melanoma Biomarker

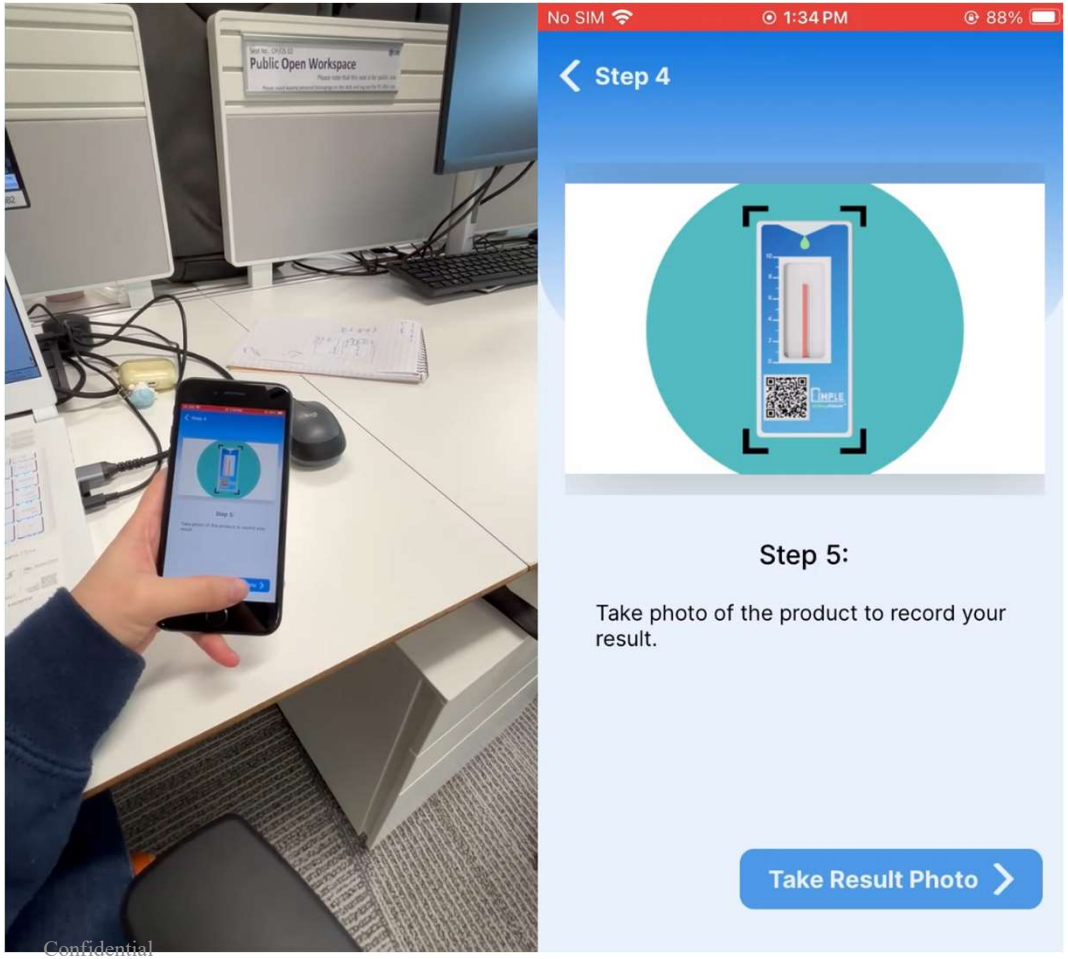


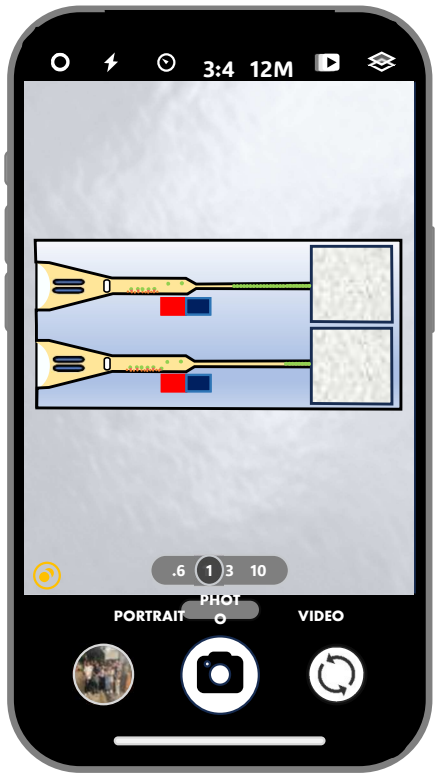


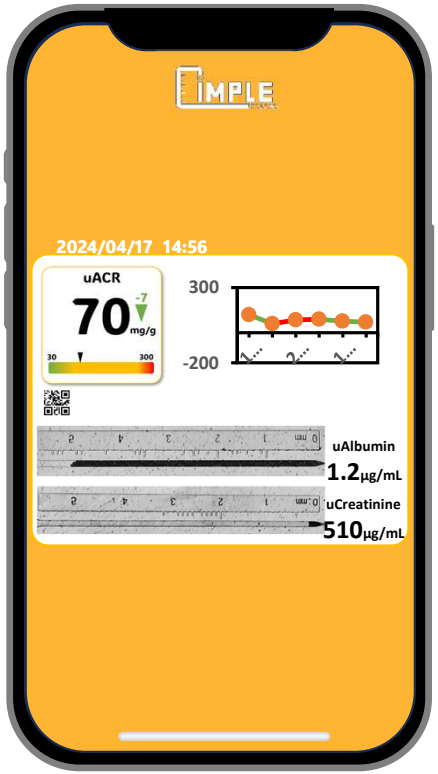


G. Wang, … C. Xu*, and T. H. Chen*, Advanced Science, 11, 2306188, 2024

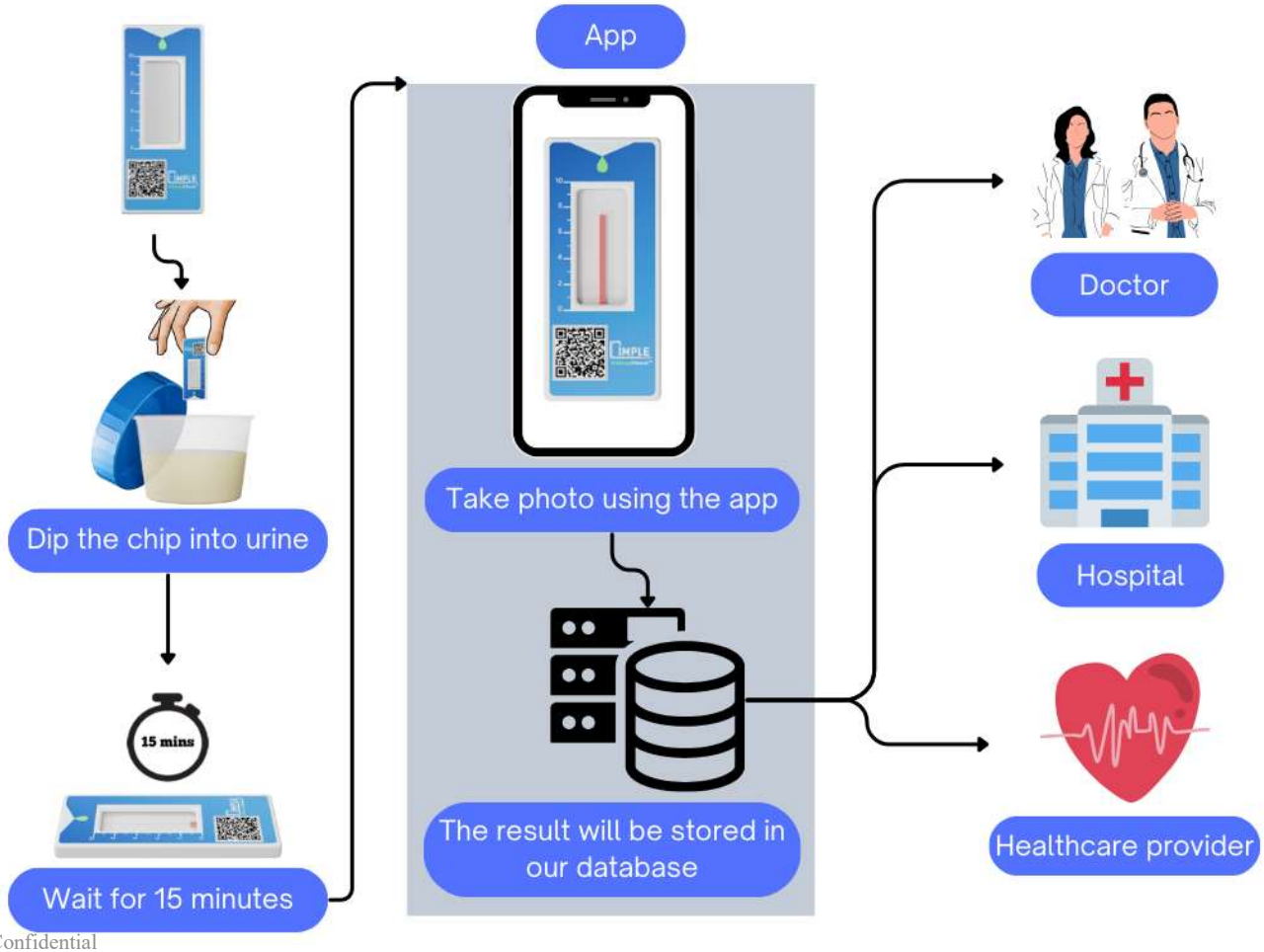
Personal Digital Health







Screening and Management At-home



Time-Saving and Effortless

Home Testing Made Easy

Applications

Platform technology

01

Chronic Disease

- **Chronic kidney disease:** Urinary Albumin Creatinine
- **Diabetes:** Glycated hemoglobin(GHb)

02

Fertility Assistance

- **Ovulation Detection:** Luteinizing Hormone (LH)

03

Infectious Disease

- **Vaccine Antibody Detection**

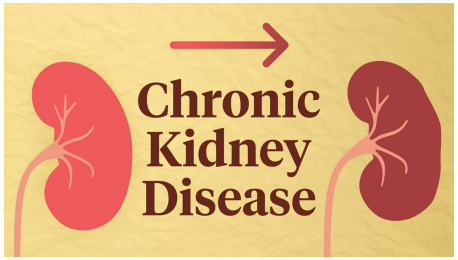
04

Cancer Early Screening

- **Liver Cancer:** AFP
- **Melanoma:** S100A1
- **Prostate Cancer:** PSA

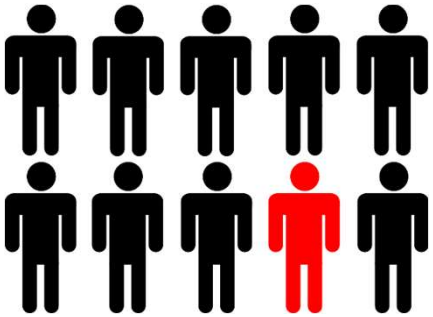
Suitable for Urine, Tissue Fluid, and Blood

Our First Product Will Focus on CKD Detection



- High-Risk Complications of Cardiovascular disease (CVD)
- Abnormal concentration of albumin in the urine
- Asymptomatic at early stage

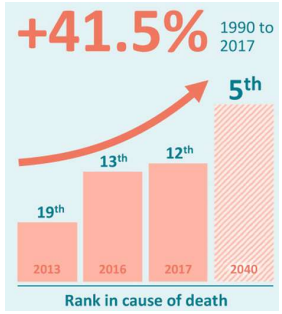
Approximately 1 in 10



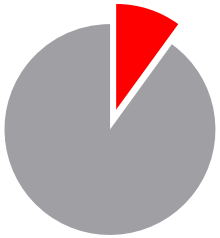
Cheap
Inaccurate

Expensive &
Time-consuming

Increasing death rate



10% CKD awareness



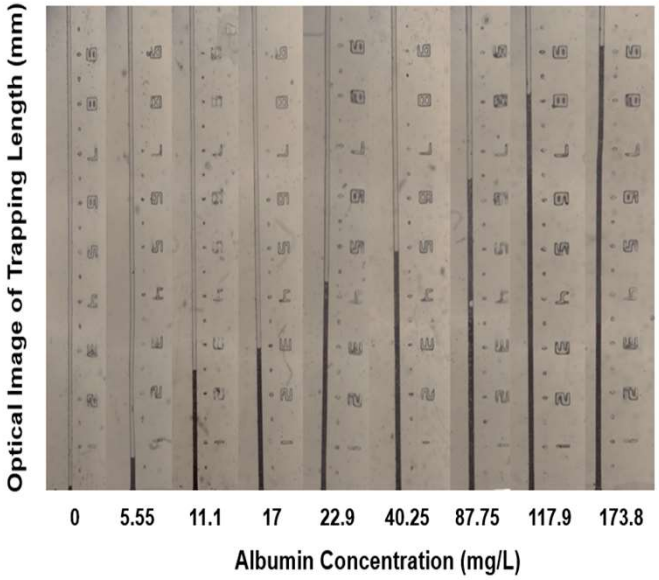
Sources: The Lancet, USA CDC

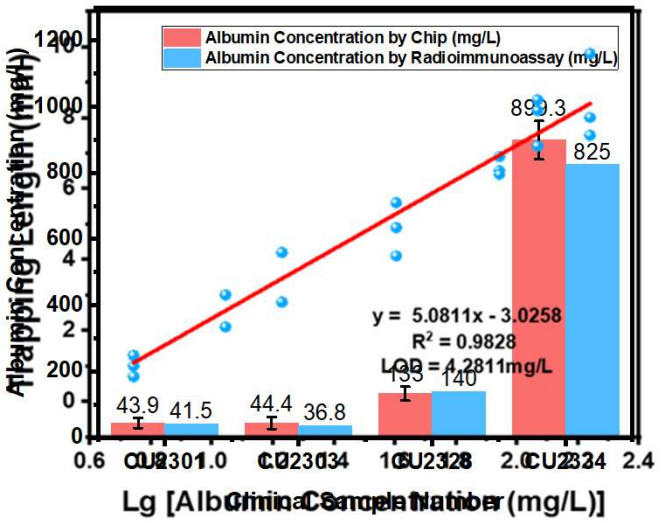
The main screening indicator for CKD is urinary albumin

Clinical criteria

Normal | **Microalbuminuria (Curable)** | **Macroalbuminuria (Incurable)**

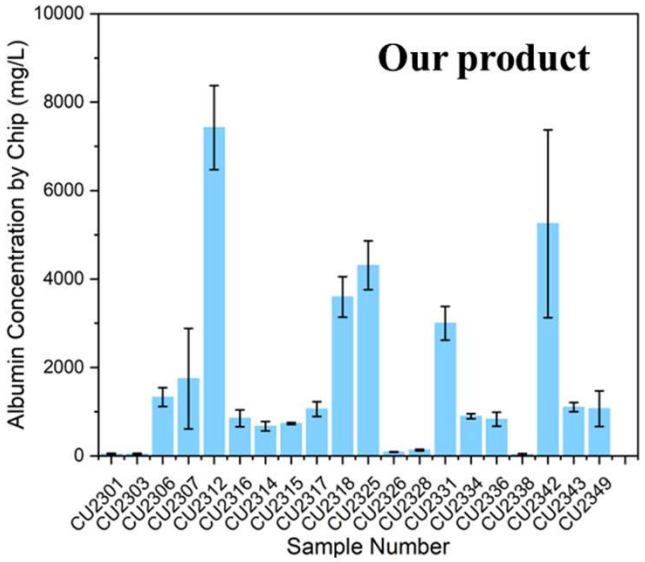
20 mg/L | **150 mg/L**

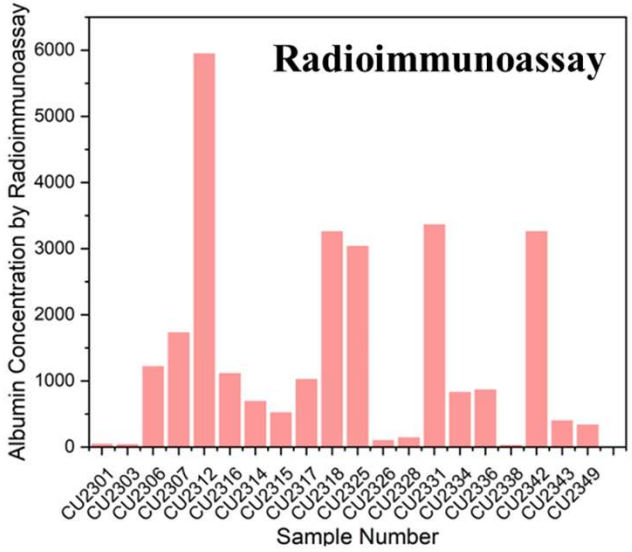


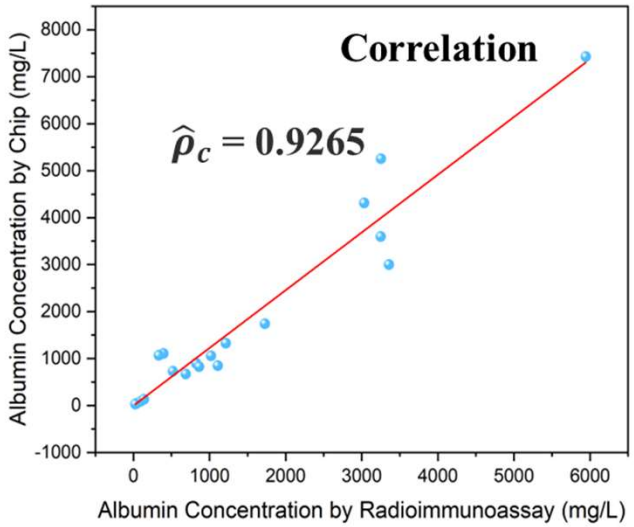


Clinical sample test

Test clinical samples from Prince of Wales Hospital using our product and Radioimmunoassay



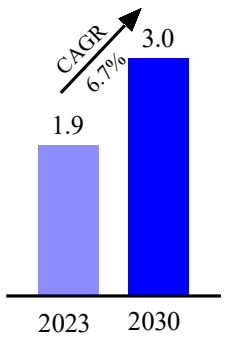




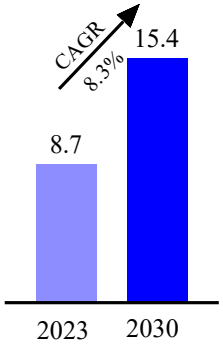
- A good correlation was achieved on a basis of Lin's concordance correlation coefficient ($\hat{p_c}$= 0.9265)

Market Size

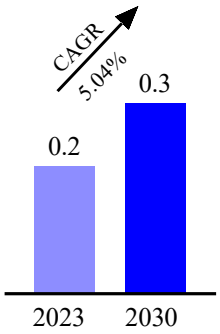
CKD dipstick urinalysis
(Billion USD)



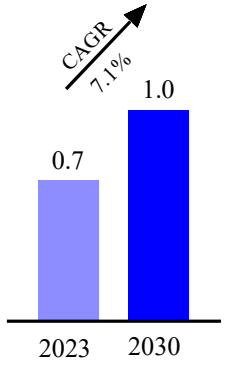
CVD
(Billion USD)



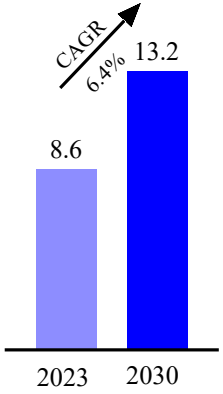
LH
(Billion USD)



AFP
(Billion USD)

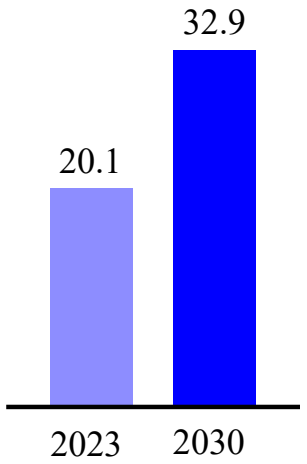


PSA
(Billion USD)



Sources:
Verified market research
Allied Market Research
DI Research
Grand View Research
Precision Business Insights
DataHorizzon Research
Prophecy Market Insights

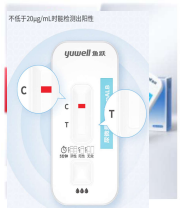
In Total
(Billion USD)



Competitive Analysis

More Affordable

Higher Accuracy



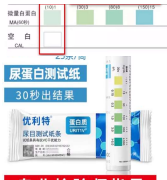
¥12.90

鱼跃(YUWELL) 尿微量白蛋白检测试剂盒（胶体金法） 肾病初筛 尿蛋白试纸

1万+条评价

鱼跃京东自营旗舰店

yuwell



天猫 优利特尿蛋白检测试纸家用目测蛋白尿慢性肾炎肾功能...

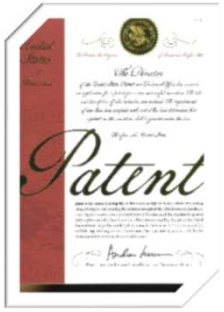
¥11.45 1万+人付款 安徽 合肥

URIT

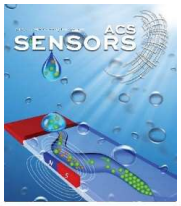
Abbott

Project Progress

Filed/accepted 9 US/PCT patents



Publications



SCIENCE ADVANCES | RESEARCH ARTICLE

CORONAVIRUS

Microfluidic particle dam for direct visualization of SARS-CoV-2 antibody levels in COVID-19 vaccinees

Minghui Wu[1†], Siying Wu[1†], Gaobo Wang[1], Wengang Liu[1], Lok Ting Chu[1], Tianyi Jiang[1], Hoi Kwan Kwong[1], Hiu Lam Chow[1], Iris Wai Sum Li[2], Ting-Hsuan Chen[1,3]*

Various COVID-19 vaccines are currently deployed, but their immunization varies and decays with time. Antibody level is a potent correlate to immune protection, but its quantitation relies on intensive laboratory techniques. Here, we report a decentralized, instrument-free microfluidic device that directly visualizes SARS-CoV-2 antibody levels. Magnetic microparticles (MMPs) and polystyrene microparticles (PMPs) can bind to SARS-CoV-2 antibodies simultaneously. In a microfluidic chip, this binding reduces the incidence of free PMPs escaping from magnetic separation and shortens PMP accumulation length at a particle dam. This visual quantitative result enables use in either sensitive mode (limit of detection (LOD): 13.3 ng/ml; sample-to-answer time: 70 min) or rapid mode (LOD: 57.8 ng/ml; sample-to-answer time: 20 min) and closely agrees with the gold standard enzyme-linked immunosorbent assay. Trials on 91 vaccinees revealed higher antibody levels in mRNA vaccinees than in inactivated-vaccinees and their decay in 45 days, demonstrating the need for point-of-care devices to monitor immune protection.

Cooperation agreement/ NDA

战略合作协议

甲方：芯普生物科技有限公司Cimple Biotechnology Limited

法定代表人：

地址：

乙方：深圳润格生物技术有限公司

法定代表人：

地址：

甲乙双方本着公平公正、互惠互利的原则，为建立长期的、稳定的、紧密型的合作伙伴关系，经认真协商，特达成协议如下：

第一条 战略合作内容

CONFIDENTIAL DISCLOSURE AGREEMENT

This Confidential Disclosure Agreement ("**Agreement**") is effective as of ective Date") and is made by and between:

microfluidic particle dam for direct visualization of SARS-CoV-2 antibody levels (the "

The Parties agree as follows:

1) **Definitions**

Press coverage

Awards

Fundraising

NO.	Description	Amount (HKD)	Usage	Notes
1	HK Tech 300 Seed Fund and Angel Fund	1.1 million	Prototype Optimization Laboratory test	Approved
2	HKSTP IDEATION and Incu-Bio Programme	6.1 million	Pilot scale test, Compliance Certifications	Approved
3	Hong Kong Centre for Cerebro-cardiovascular Health Engineering Commercialization Grant	>1 million	Prototype Optimization	Approved
4	Technology Start-up Support Scheme for Universities (TSSSU)	~0.9 million	Laboratory test	Shortlisted
5	Angel Fund from a VC	1 million	Laboratory test	Approved
6	RAISe+ Scheme		Mass production, other pipelines development	Nominated by CityU and has received tens of millions of HKD investment intention

Team Introduction

Ting-Husan Chen
Chief Scientist

Associate Professor of BME in CityUHK.
Ph.D.
Published 40+ papers.

Wengang Liu
CEO

Ph.D.
Several years of biotech business experience.

Siying Wu
CTO

Ph.D.
Extensive experience in biosensing with several top publications.

Qin Zhang
Chief Consultant

25 years+ of medical industry experiences.
Marketing Director of GE Healthcare, BD, Abbott.
Product & sales management Pfizer, Roche, MSD).

Liman Li
Chief Engineer

10 years+ in *in vitro* diagnostic reagents development, with expertise in R&D and project management processes in a listed company.

Chenyu Cui
Research Scientist

Ph.D.
Extensive experience in chemistry analysis and biosensing.

Business Partners

Clinical Partners

Prototype optimization, clinical sample testing

香港中文大學醫院 CUHK Medical Centre

南方醫科大學深圳医院 Shenzhen Hospital of Southern Medical University

Prof. Cheuk Chun Szeto, The Chinese University of Hong Kong
Prof. Tak-Mao Chan, The University of Hong Kong
Dr. Lok Ting CHU, Guangdong Medical University
Ms. Yao Lu, Shenzhen Hospital of Southern Medical University

Commercialization Advisor

Regulatory & Mass production & Marketing (China)

润铭生物 RUNMING BIOTECH

华润医药商业 CR PHARMA COMM
菲鹏生物 FAPON BIOTECH
Joint Venture

Dr. Bin Sun, General Manager

Marketing Advisor

B2B, global market

GE HealthCare

Mr. Dicky Wong, VP & General Manager

Thank you for the attention